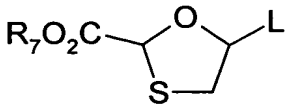
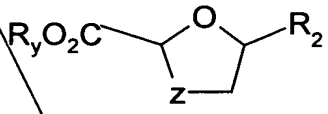


(XVI) ;

reacting the compound of formula (XVI) with a silylated R_2- compound , in the presence of a Lewis acid, whereby said leaving group is displaced, to produce a compound of formula (XVII):

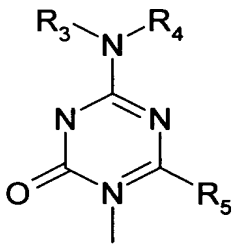


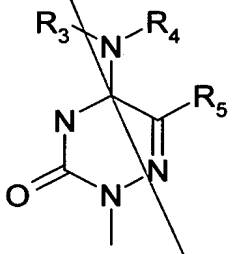
(XVII) ,

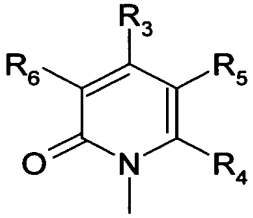
wherein

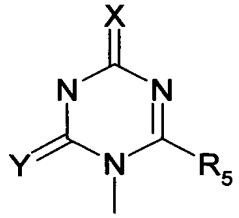
Z is S;

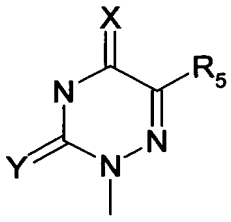
R_2 is selected from the following group:

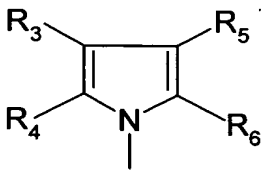


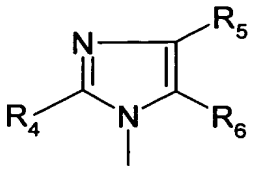


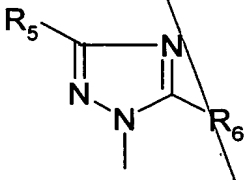


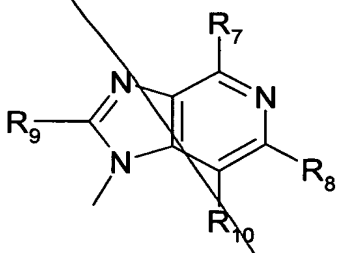
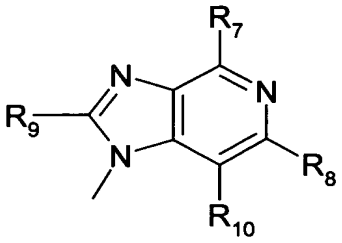
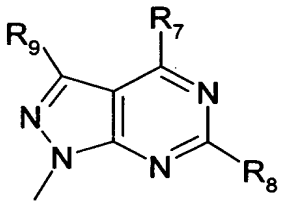
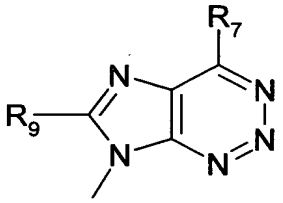
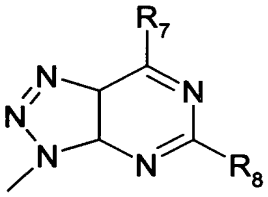
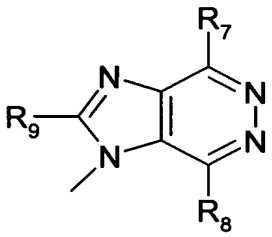










X is oxygen or sulfur;

Y is oxygen or sulfur;

R_3 and R_4 are independently selected from hydrogen, hydroxyl, amino, C_{1-6} alkyl, C_{2-6} alkenyl, C_{2-6} alkynyl, and C_{1-10} acyl or aracyl;

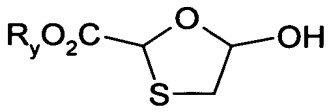
R_5 and R_6 are independently selected hydrogen, halogen, hydroxyl, amino, cyano, carboxy, carbamoyl, alkoxycarbonyl, hydroxymethyl, trifluoromethyl, thioaryl, C_{1-6} alkyl, C_{2-6} alkenyl, C_{2-6} alkynyl, and C_{1-10} acyloxy;

R_7 and R_8 are independently selected from hydrogen, hydroxy, alkoxy, thiol, thioalkyl, amino, halogen, cyano, carboxy, alkoxycarbonyl, carbamoyl, C_{1-6} alkyl, C_{2-6} alkenyl, C_{2-6} alkynyl, and C_{1-10} acyloxy; and

R_9 and R_{10} are independently selected from the hydrogen, hydroxy, alkoxy, amino, halogen, azido, C_{1-6} alkyl, C_{2-6} alkenyl, C_{2-6} alkynyl, and C_{1-10} acyloxy.

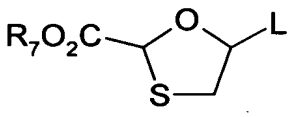
36. A process comprising:

reacting a mercaptoacetaldehyde with a compound of formula $R_yOOCCHO$, wherein R_y is C_{1-12} alkyl or C_{6-20} aryl to obtain a compound of formula (XV)



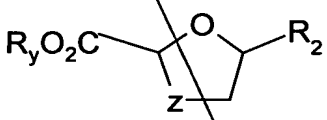
(XV) ;

converting the hydroxyl group of the compound of formula (XV) to a leaving group L to obtain a compound of formula (XVI):



(XVI) ;

reacting the compound of formula (XVI) with a silylated R_2- compound , in the presence of a Lewis acid, whereby said leaving group is displaced, to produce a compound of formula (XVII):

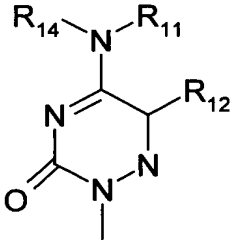


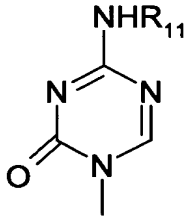
(XVII) ;

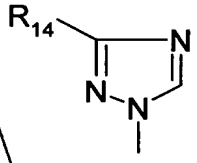
wherein

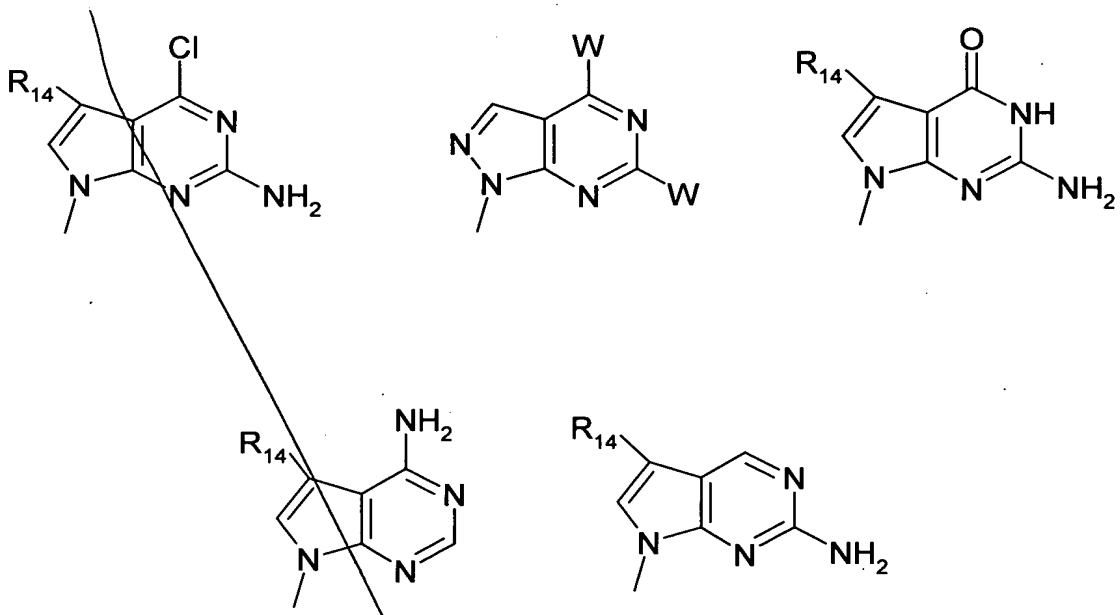
Z is S;

R_2 is selected from the following group:









wherein

each R_{11} is independently selected from hydrogen, acetyl, and C_{1-6} alkyl;

R_{12} and R_{13} are independently selected from hydrogen, hydroxymethyl, trifluoromethyl, C_{1-6} alkyl, C_{1-6} alkenyl, bromine, chlorine, fluorine, and iodine;

R_{14} is selected from hydrogen, cyano, carboxy, ethoxycarbonyl, carbamoyl, and thiocarbamoyl; and

each W is independently selected from hydrogen, bromine, chlorine, fluorine, iodine, amino, and hydroxyl.

37. A process according to claim 35, wherein L is OR_z, wherein R_z is selected from: C_{1-6} alkyl groups, aliphatic or aromatic C_{1-6} acyl groups, saturated or unsaturated alkoxycarbonyl groups, sulphonyl imidazolide, carbonyl imidazolide, aliphatic or aromatic amino carbonyl groups, alkyl imidate groups, saturated or unsaturated phosphinoyl, and aliphatic or aromatic sulphonyl groups.

38. A process according to claim 36, wherein L is OR_z, wherein R_z is selected from: C_{1-6} alkyl groups, aliphatic or aromatic C_{1-6} acyl groups, saturated or unsaturated alkoxycarbonyl groups, sulphonyl imidazolide, carbonyl imidazolide, aliphatic or aromatic

amino carbonyl groups, alkyl imidate groups, saturated or unsaturated phosphinoyl, and aliphatic or aromatic sulphonyl groups.

39. A process according to claim 35, wherein the mercaptoacetaldehyde is a monomer obtained from 1,4-dithiane-2,5-diol dissolved in an inert solvent.

40. A process according to claim 39, wherein said inert solvent is selected from the group consisting of: pyridine, toluene and DMSO.

41. A process according to claim 35, wherein said compound of formula RyOOCCHO is ethyl gloxylate.

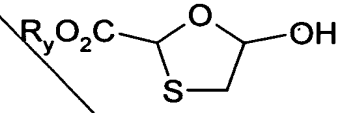
42. A process according to claim 36, wherein the mercaptoacetaldehyde is a monomer obtained from 1,4-dithiane-2,5-diol dissolved in an inert solvent.

43. A process according to claim 42, wherein said inert solvent is selected from the group consisting of: pyridine, toluene and DMSO.

44. A process according to claim 36, wherein said compound of formula RyOOCCHO is ethyl gloxylate.

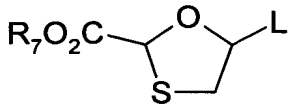
45. A process comprising:

reacting a mercaptoacetaldehyde with a compound of formula $R_yOOCCHO$, wherein R_y is $C_{1\text{-}12}$ alkyl or $C_{6\text{-}20}$ aryl to obtain a compound of formula (XV)



(XV) ;

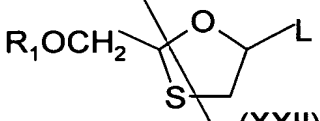
converting the hydroxyl of the compound of formula (XV) to a leaving group L to obtain a compound of formula (XVI):



(XVI) ;

converting the group R_7O_2C of the compound of formula (XVI) to a hydroxymethyl group;

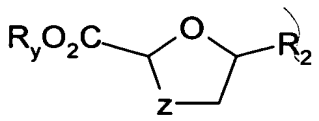
protecting the resulting hydroxymethyl with a protecting function R_1 to obtain a compound of formula (XXII):



(XXII) ;

wherein R_1 is selected from the group consisting of C_{1-16} acyl, t-butyldimethylsilyl, and t-butyldiphenylsily;

reacting the compound of formula (XXII) with a silylated-R_2 compound, in the presence of a Lewis acid, whereby said leaving group is displaced, to obtain a compound of formula (XXIII):

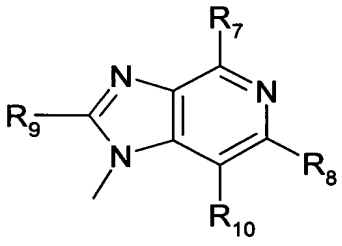
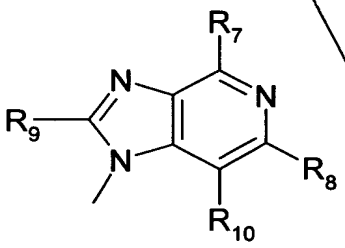
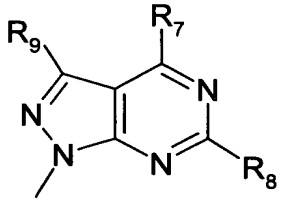
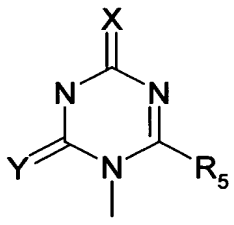
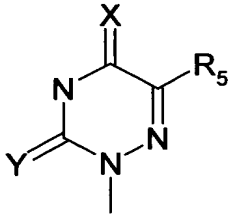
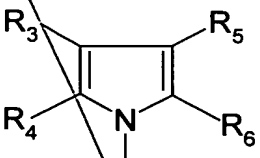
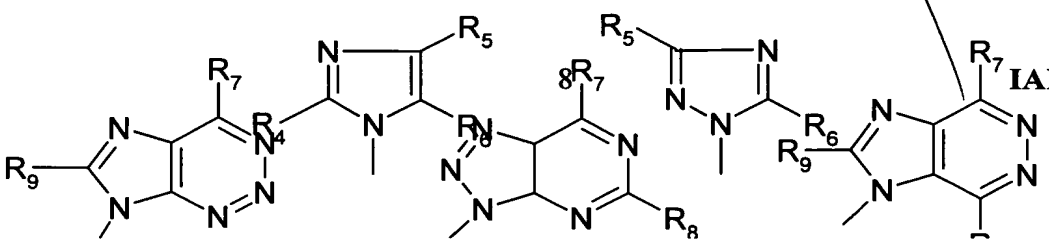


(XXIII)

wherein

Z is S;

R_2 is selected from the following group:

X is oxygen or sulfur;

Y is oxygen or sulfur;

R_3 and R_4 are independently selected from hydrogen, hydroxyl, amino, C_{1-6} alkyl, C_{2-6} alkenyl, C_{2-6} alkynyl, and C_{1-10} acyl or aracyl;

R_5 and R_6 are independently selected hydrogen, halogen, hydroxyl, amino, cyano, carboxy, carbamoyl, alkoxycarbonyl, hydroxymethyl, trifluoromethyl, thioaryl, C_{1-6} alkyl, C_{2-6} alkenyl, C_{2-6} alkynyl, and C_{1-10} acyloxy;

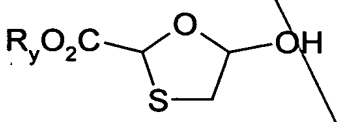
R_7 and R_8 are independently selected from hydrogen, hydroxy, alkoxy, thiol, thioalkyl, amino, halogen, cyano, carboxy, alkoxycarbonyl, carbamoyl, C_{1-6} alkyl, C_{2-6} alkenyl, C_{2-6} alkynyl, and C_{1-10} acyloxy; and

R_9 and R_{10} are independently selected from the hydrogen, hydroxy, alkoxy, amino, halogen, azido, C_{1-6} alkyl, C_{2-6} alkenyl, C_{2-6} alkynyl, and C_{1-10} acyloxy; and

optionally further comprising oxidizing Z of said compound of formula (XXIII) to obtain a compound of formula (XXIII) wherein Z is S=O or SO_2.

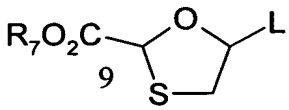
46. A process comprising:

reacting a mercaptoacetaldehyde with a compound of formula $R_yOOCCHO$, wherein R_y is C_{1-12} alkyl or C_{6-20} aryl to obtain a compound of formula (XV)



(XV) ;

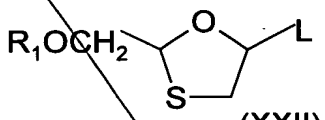
converting the hydroxyl of the compound of formula (XV) to a leaving group L to obtain a compound of formula (XVI):



(XVI) ;

converting the group R_7O_2C of the compound of formula (XVI) to a hydroxymethyl group;

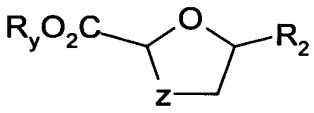
protecting the resulting hydroxymethyl with a protecting function R_1 to obtain a compound of formula (XXII):



(XXII)

wherein R_1 is selected from the group consisting of C_{1-16} acyl, t-butyldimethylsilyl, and t-butyldiphenylsily;

reacting the compound of formula (XXII) with a silylated-R_2 compound, in the presence of a Lewis acid, whereby said leaving group is displaced, to obtain a compound of formula (XXIII):

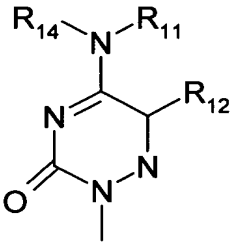


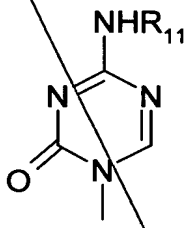
(XXIII)

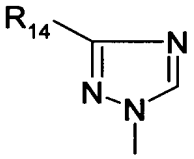
wherein

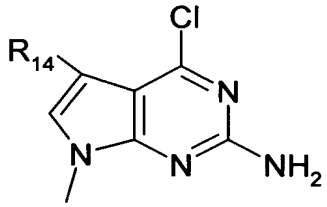
Z is S;

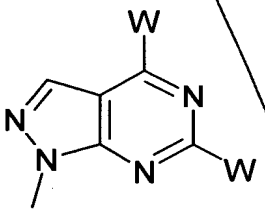
R_2 is selected from the following group:

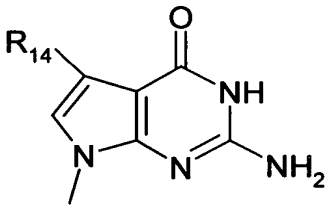


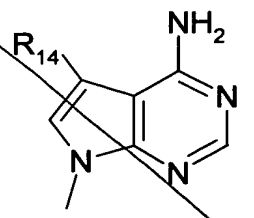


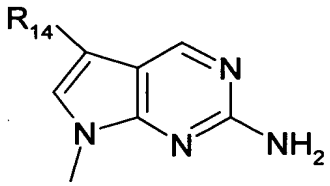












wherein

each R_{11} is independently selected from hydrogen, acetyl, and C_{1-6} alkyl;

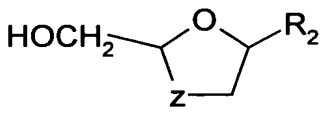
R_{12} and R_{13} are independently selected from hydrogen, hydroxymethyl, trifluoromethyl, C_{1-6} alkyl, C_{1-6} alkenyl, bromine, chlorine, fluorine, and iodine;

R_{14} is selected from hydrogen, cyano, carboxy, ethoxycarbonyl, carbamoyl, and thiocarbamoyl; and

each W is independently selected from hydrogen, bromine, chlorine, fluorine, iodine, amino, and hydroxyl; and

optionally further comprising oxidizing Z of said compound of formula (XXIII) to obtain a compound of formula (XXIII) wherein Z is S=O or SO_2.

47. A process according to claim 45, further comprising the step of removing the hydroxyl protecting function R_1 from compound (XXIII) to obtain a compound of formula (I):

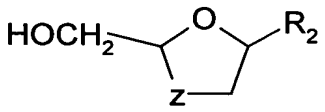


(I)

wherein Z is S, S=O, or SO_2, and R_2 is as defined.

48. A process according to claim 47, wherein the Lewis acid is selected from the group consisting of: TMSOTf, TMSI, $TiCl_4$ and $SnCl_4$.

49. A process according to claim 46, further comprising the step of removing the hydroxyl protecting function R_1 from compound (XXIII) to obtain a compound of formula (I):



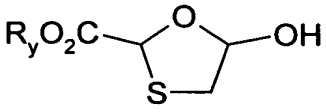
(I)

wherein Z is S, S=O, or SO_2, and R_2 is as defined.

50. A process according to claim 49, wherein the Lewis acid is selected from the group consisting of: TMSOTf, TMSI, $TiCl_4$ and $SnCl_4$.

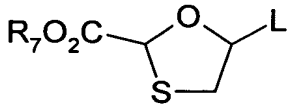
51. A process comprising:

reacting a mercaptoacetaldehyde with a compound of formula $R_yOOCCHO$, wherein R_y is $C_{1\text{-}12}$ alkyl or $C_{6\text{-}20}$ aryl to obtain a compound of formula (XV)



(XV) ;

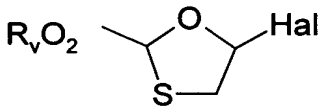
converting the hydroxyl of the compound of formula (XV) to a leaving group L to obtain a compound of formula (XVI):



(XVI) ;

B1

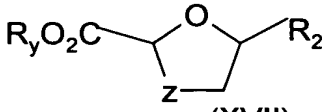
reacting the compound of formula (XVI) with a halogen-containing Lewis acid to obtain a compound of formula (XXVI):



(XVI) ;

wherein Hal is a halogen,

coupling the compound of formula (XXVI) with a silylated-R_2 compound, under basic condition, whereby said halogen is displaced to obtain a compound of formula (XVII):

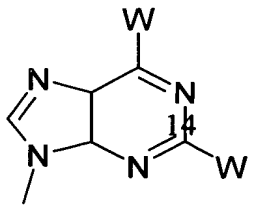


(XVII)

wherein

Z is S;

R_2 is



; and

W is bromine, chlorine, fluorine, iodine, amino, or hydroxyl.

52. A process according to claim 51, wherein said halogen is iodine.

53. A process according to claim 51, wherein said Lewis acid is trimethylsilyl iodide.

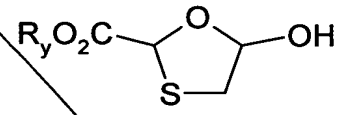
B1

54. A process according to claim 53, wherein said purine compound is 6-chloropurine.

55. A process comprising:

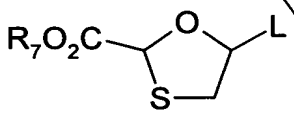
reacting a mercaptoacetaldehyde with a compound of formula $R_yOOCCHO$, wherein R_y is $C_{1\text{-}12}$ alkyl or $C_{6\text{-}20}$ aryl to obtain a compound of formula (XV)

Sub D3



(XV) ;

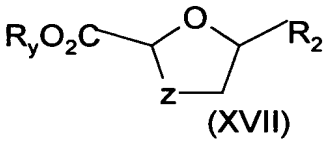
converting the hydroxyl of the compound of formula (XV) to a leaving group L to obtain a compound of formula (XVI):



(XVI) ;

reacting the compound of formula (XVI) with a silylated -R_2 compound in the

presence of a Lewis acid, whereby said leaving group is displaced, to produce a compound of formula (XVII):

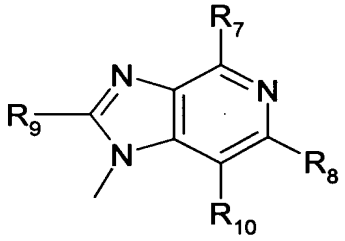


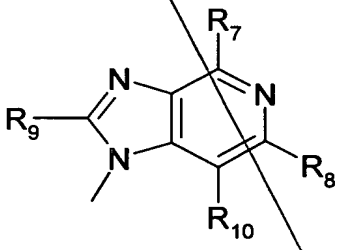
(XVII)

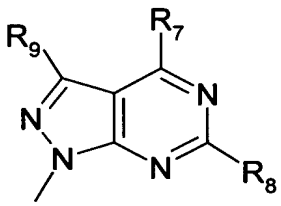
wherein

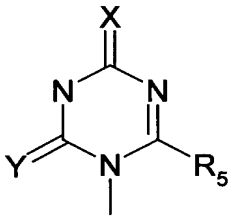
Z is S;

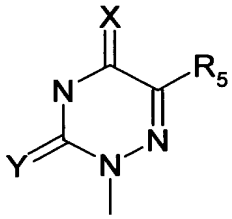
R_2 is selected from the following group:

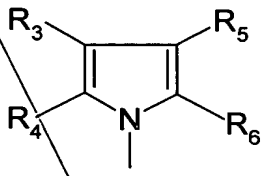


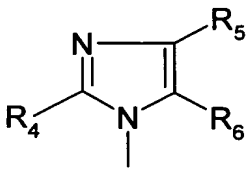


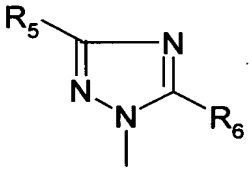


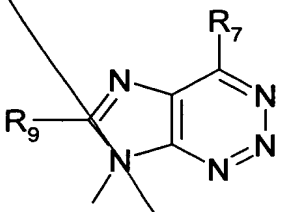
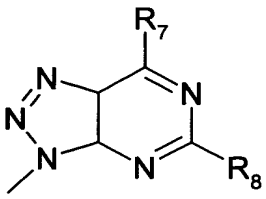
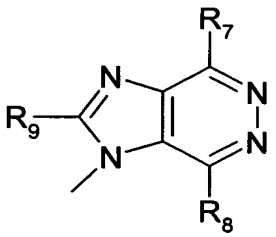










X is oxygen or sulfur;

Y is oxygen or sulfur;

R_3 and R_4 are independently selected from hydrogen, hydroxyl, amino, C_{1-6} alkyl, C_{2-6} alkenyl, C_{2-6} alkynyl, and C_{1-10} acyl or aracyl;

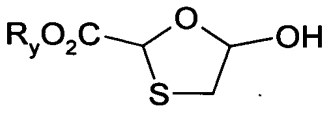
R_5 and R_6 are independently selected hydrogen, halogen, hydroxyl, amino, cyano, carboxy, carbamoyl, alkoxycarbonyl, hydroxymethyl, trifluoromethyl, thioaryl, C_{1-6} alkyl, C_{2-6} alkenyl, C_{2-6} alkynyl, and C_{1-10} acyloxy;

R_7 and R_8 are independently selected from hydrogen, hydroxy, alkoxy, thiol, thioalkyl, amino, halogen, cyano, carboxy, alkoxycarbonyl, carbamoyl, C_{1-6} alkyl, C_{2-6} alkenyl, C_{2-6} alkynyl, and C_{1-10} acyloxy; and

R_9 and R_{10} are independently selected from the hydrogen, hydroxy, alkoxy, amino, halogen, azido, C_{1-6} alkyl, C_{2-6} alkenyl, C_{2-6} alkynyl, and C_{1-10} acyloxy.

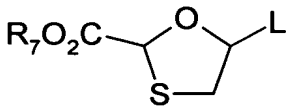
56. A process comprising:

reacting a mercaptoacetaldehyde with a compound of formula $R_yOOCCHO$, wherein R_y is C_{1-12} alkyl or C_{6-20} aryl to obtain a compound of formula (XV)



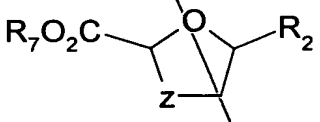
(XV) ;

converting the hydroxyl of the compound of formula (XV) to a leaving group L to obtain a compound of formula (XVI):



(XVI) ;

reacting the compound of formula (XVI) with a silylated -R_2 compound in the presence of a Lewis acid, whereby said leaving group is displaced, to produce a compound of formula (XVII):

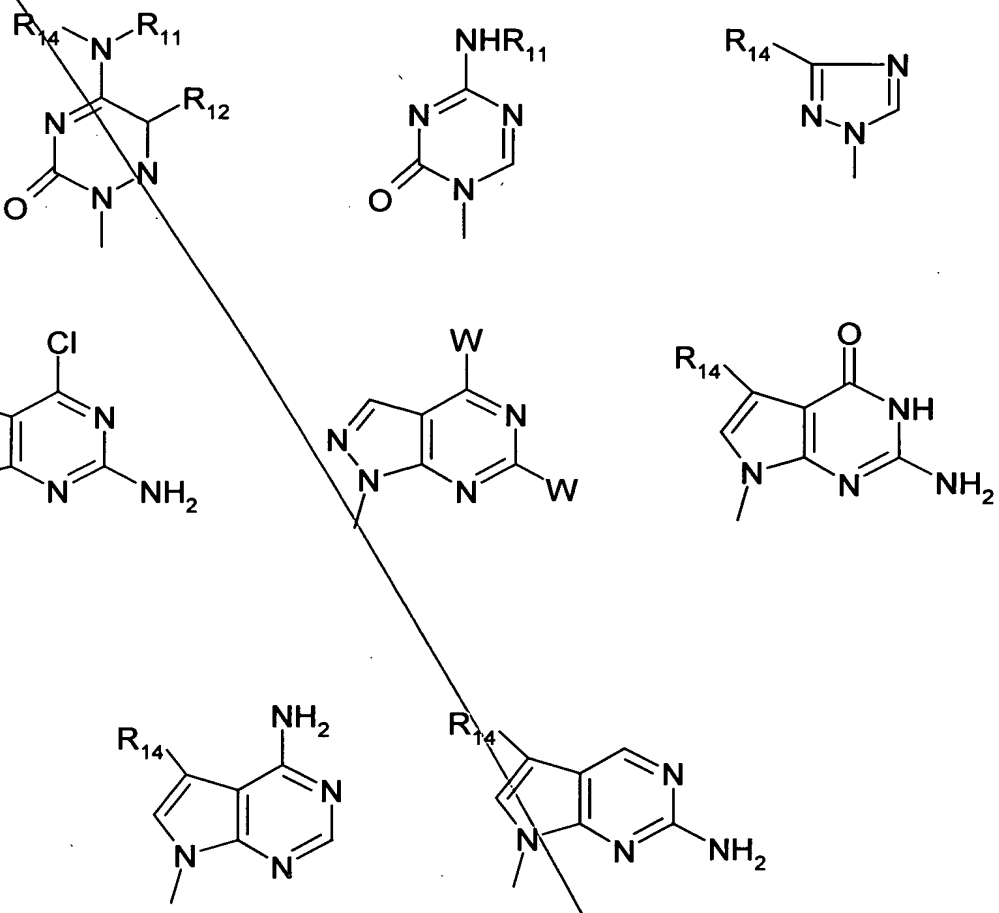


(XVII)

wherein

Z is S;

R_2 is selected from the following group:



each R_{11} is independently selected from hydrogen, acetyl, and C_{1-6} alkyl;

R_{12} and R_{13} are independently selected from hydrogen, hydroxymethyl, trifluoromethyl, C_{1-6} alkyl, C_{1-6} alkenyl, bromine, chlorine, fluorine, and iodine;

R_{14} is selected from hydrogen, cyano, carboxy, ethoxycarbonyl, carbamoyl, and thiocarbamoyl; and

each W is independently selected from hydrogen, bromine, chlorine, fluorine, iodine, amino, and hydroxyl.

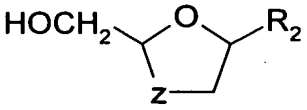
57. A process according to claim 55, further comprising oxidizing Z of the compound of formula (XVII) to give a compound of formula (XVII) wherein Z is S=O or SO_2.

58. A process according to claim 55, wherein the Lewis acid is selected from the group consisting of: TMSOTf, TMSI, $TiCl_4$ and $SnCl_4$.

59. A process according to claim 55, further comprising

optionally oxidizing Z of the compound of formula (XVII) to give a compound of formula XVII wherein Z is S=O or SO_2 and

reducing the R_yO_2C group of the compound of formula (XVII) to obtain a compound of formula (I):



(I)

wherein:

Z is selected from the group consisting of S, S=O and SO_2.

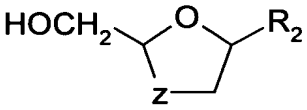
60. A process according to claim 56, further comprising oxidizing Z of the compound of formula (XVII) to give a compound of formula (XVII) wherein Z is S=O or SO_2.

61. A process according to claim 56, wherein the Lewis acid is selected from the group consisting of: TMSOTf, TMSI, $TiCl_4$ and $SnCl_4$.

62. A process according to claim 56, further comprising

optionally oxidizing Z of the compound of formula (XVII) to give a compound of formula XVII wherein Z is S=O or SO_2 and

reducing the R_yO_2C group of the compound of formula (XVII) to obtain a compound of formula (I):



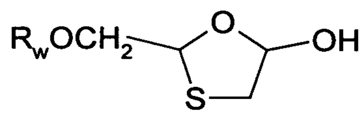
(I)

wherein:

Z is selected from the group consisting of S, S=O and SO_2.

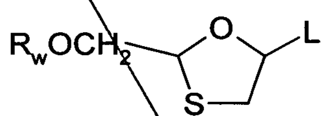
63. A process comprising:

reacting a mercaptoacetaldehyde with a compound of formula R_wOCH_2CHO, under neutral or basic conditions, wherein R_w is hydrogen or a hydroxyl protecting group to obtain a compound of formula (XIII)



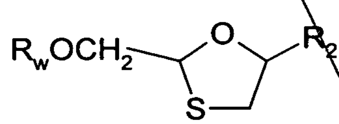
(XIII) ;

converting the hydroxyl of the compound of formula (XIII) to a leaving group L to obtain a compound of formula (XIV):



(XVI) ;

reacting the compound of formula (XIV) with a silylated purine or pyrimidine base or derivative thereof R_2, in the presence of a Lewis acid, said leaving group is displaced, to produce a compound of formula (IX):

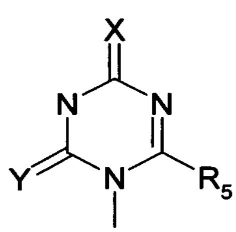


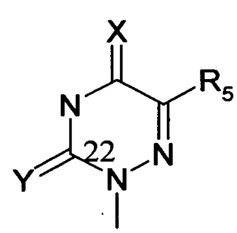
(IX) ;

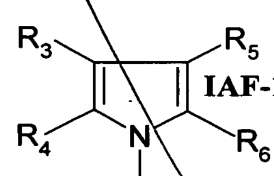
wherein

Z is S, and

R_2 is selected from the following group:







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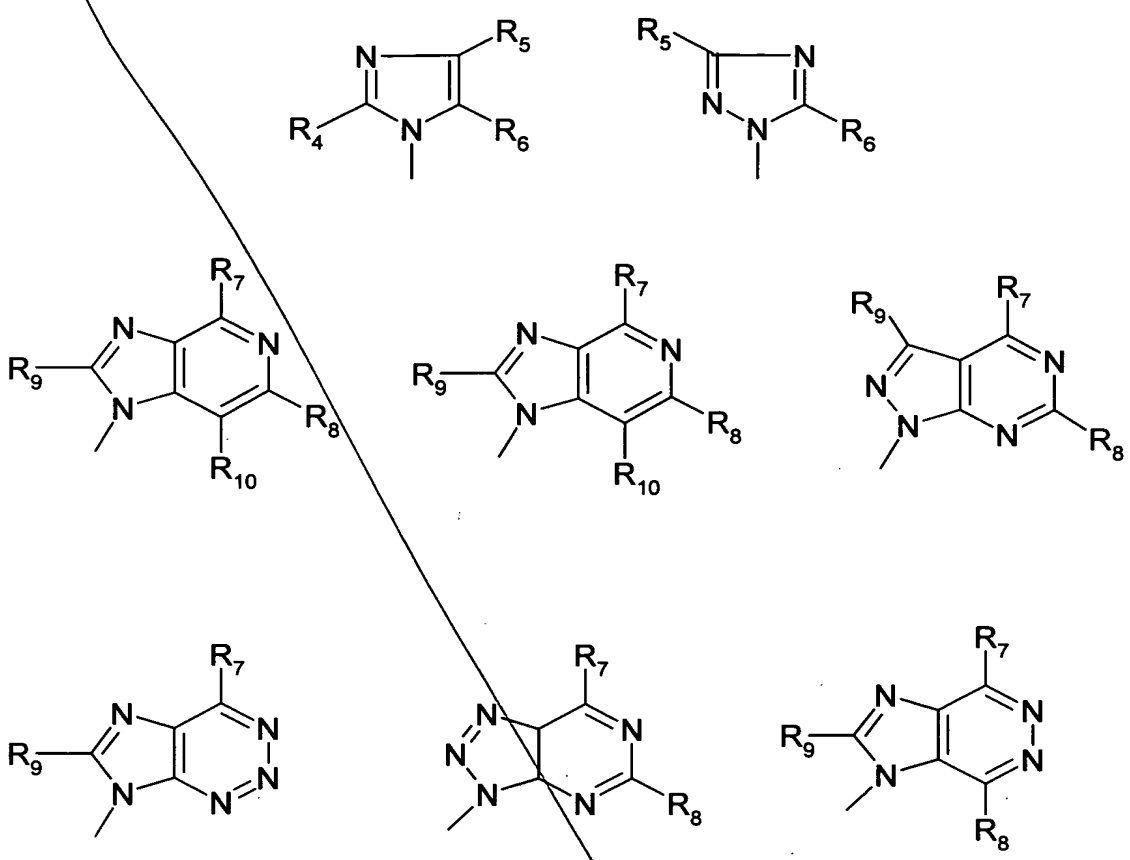


X is oxygen or sulfur; Y is oxygen or sulfur;

R_3 and R_4 are independently selected from the group consisting of hydrogen, hydroxyl, amino, substituted or unsubstituted C_{1-6} alkyl or C_{2-6} alkenyl or C_{2-6} alkynyl, and substituted or unsubstituted C_{1-10} acyl or aracyl;

R_5 and R_6 are independently selected from the group consisting of hydrogen, halogen, hydroxyl, amino, cyano, carboxy, carbamoyl, alkoxycarbonyl, hydroxymethyl, trifluoromethyl, thioaryl, substituted or unsubstituted C_{1-6} alkyl or C_{2-6} alkenyl or C_{2-6} alkynyl, and substituted or unsubstituted C_{1-10} acyloxy;

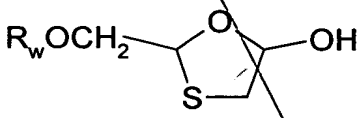
R_7 and R_8 are independently selected from the group consisting of hydrogen, hydroxy, alkoxy, thiol, thioalkyl, amino, substituted amino, halogen, cyano, carboxy, alkoxycarbonyl, carbamoyl, substituted or unsubstituted C_{1-6} alkyl, or C_{2-6} alkenyl, or C_{2-6} alkynyl, and substituted or unsubstituted C_{1-10} acyloxy; and

R_9 and R_{10} are independently selected from the group consisting of hydrogen, hydroxy, alkoxy, amino, substituted amino, halogen, azido, substituted or unsubstituted C_{1-6} alkyl or C_{2-6} alkenyl or C_{2-6} alkynyl, and substituted or unsubstituted C_{1-10} acyloxy+ and

optionally further comprising oxidizing Z of said compound of formula (IX) to obtain a compound of formula (IX) wherein Z is S=O or SO_2.

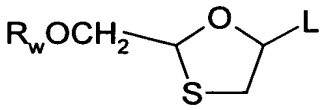
64. A process comprising:

reacting a mercaptoacetaldehyde with a compound of formula R_wOCH_2CHO, under neutral or basic conditions, wherein R_w is hydrogen or a hydroxyl protecting group to obtain a compound of formula (XIII)



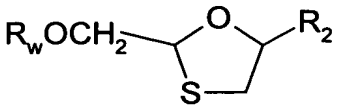
(XIII) ;

converting the hydroxyl of the compound of formula (XIII) to a leaving group L to obtain a compound of formula (XIV):



(XVI) ;

reacting the compound of formula (XIV) with a silylated purine or pyrimidine base or derivative thereof R_2, in the presence of a Lewis acid, said leaving group is displaced, to produce a compound of formula (IX):

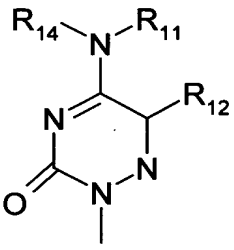


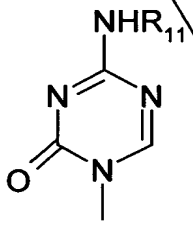
(IX) ;

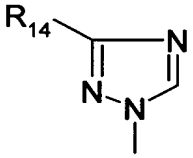
wherein

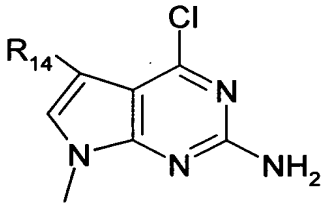
Z is S, and

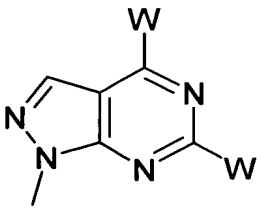
R_2 is selected from the following gtroup:

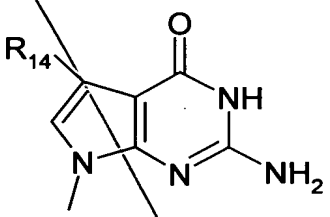


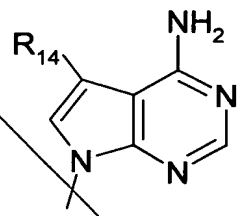
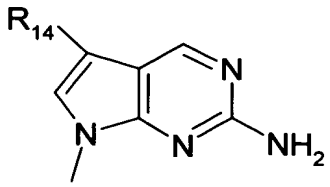










wherein

each R_{11} is independently selected from hydrogen, acetyl, and C_{1-6} alkyl groups;

R_{12} and R_{13} are independently selected from hydrogen, hydroxymethyl, trifluoromethyl, substituted or unsubstituted C_{1-6} alkyl or alkenyl, bromine, chlorine, fluorine, and iodine;

R_{14} is selected from hydrogen, cyano, carboxy, ethoxycarbonyl, carbamoyl, and thiocarbamoyl; and

each W is independently selected from hydrogen, bromine, chlorine, fluorine, iodine, amino, and hydroxyl groups.

65. A process according to claim 63, wherein L is OR_z, wherein R_z is selected from: C_{1-6} alkyl groups, aliphatic or aromatic C_{1-6} acyl groups, saturated or unsaturated alkoxycarbonyl groups, sulphonyl imidazolide, carbonyl imidazolide, aliphatic or aromatic amino carbonyl groups, alkyl imidate groups, saturated or unsaturated phosphinoyl, and aliphatic or aromatic sulphonyl groups.

66. A process according to claim 64, wherein L is OR_z, wherein R_z is selected from: C_{1-6} alkyl groups, aliphatic or aromatic C_{1-6} acyl groups, saturated or unsaturated alkoxycarbonyl groups, sulphonyl imidazolide, carbonyl imidazolide, aliphatic or aromatic amino carbonyl groups, alkyl imidate groups, saturated or unsaturated phosphinoyl, and aliphatic or aromatic sulphonyl groups.

67. A process according to claim 63, wherein the mercaptoacetaldehyde is a

monomer obtained from 1,4-dithiane-2,5-diol dissolved in an inert solvent.

68. A process according to claim 67, wherein said inert solvent is selected from pyridine, toluene and DMSO.

69. A process according to claim 63, further comprising oxidizing the sulfur of the compound of formula (IX) to give a compound of formula (IX) wherein Z is S=O or SO_2.

70. A process according to claim 64, wherein the mercaptoacetaldehyde is a monomer obtained from 1,4-dithiane-2,5-diol dissolved in an inert solvent.

71. A process according to claim 70, wherein said inert solvent is selected from pyridine, toluene and DMSO.

72. A process according to claim 64, further comprising oxidizing the sulfur of the compound of formula (IX) to give a compound of formula (IX) wherein Z is S=O or SO_2.

73. A compound selected from the group consisting of:
trans-2-hydroxymethyl-5-acetoxy-1, 3-oxathiolane;
cis-2-benzoyloxymethyl-5-hydroxy-1,3-oxathiolane,
trans-2-benzoyloxymethyl-5-hydroxy-1,3-oxathiolane and mixtures thereof;
cis-2-benzoyloxymethyl-5-(4′,5′-dichlorobenzoyloxy)-1,3-oxathiolane, *trans*-2-benzoyloxymethyl-5-(4′,5′-dichlorobenzoyloxy)-1,3-oxathiolane and mixtures thereof;
cis-2- benzoyloxymethyl-5-trimethylacetoxy-1,3-oxathiolane, *trans*-2-benzoyloxymethyl-5-trimethylacetoxy-1,3-oxathiolane and mixtures thereof;
cis-2-benzoyloxymethyl-5-(2′, 2′, 2′-trichloroethoxycarbonyloxy)-1,3-oxathiolane, *trans*-2-benzoyloxymethyl-5-(2′, 2′, 2′-trichloroethoxycarbonyloxy)-1, 3-oxathiolane and mixtures thereof;
cis-2-benzoyloxymethyl-5-ethoxycarbonyloxy-1, 3-oxathiolane, *trans*-2- benzoyloxymethyl-5- ethoxycarbonyloxy-1, 3-oxathiolane and mixtures thereof;

cis-2-carboethoxy-5-methoxycarbonyloxy-1, 3-oxathiolane, *trans*-2-carboethoxy-5-methoxycarbonyloxy-1, 3-oxathiolane and mixtures thereof;

cis-2-carboethoxy-5-acetoxy-1, 3-oxathiolane, *trans*-2-carboethoxy-5-acetoxy-1, 3-oxathiolane and mixtures thereof;

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cis-2-carboethoxy-5-(N4′-acetylcytosin-1′-yl) -1, 3-oxathiolane;

cis-2-carboethoxy-5-(uracil-1′-yl) -1, 3-oxathiolane;

cis-benzoyloxymethyl-5-(cytosin-1′-yl)-1, 3-oxathiolane;

cis-ethyl-5-iodo-1, 3-oxathiolan-2-carboxylate, *trans*-ethyl-5-iodo-1, 3-oxathiolan-2-carboxylate and mixtures thereof;

cis-ethyl-5-(6′-chloropurin-9′-yl)-1, 3-oxathiolan-2-carboxylate, *trans*-ethyl-5-(6′-chloropurin-9′-yl)-1, 3-oxathiolan-2-carboxylate and mixtures thereof; and

cis-ethyl-5-(6′chloropurin-7′-yl)-1, 3-oxathiolan-2-carboxylate, *trans*-ethyl-5-(6′-chloropurin-7′-yl)-1, 3-oxathiolan-2-carboxylate and mixtures thereof.